Date, 2020

DRAFT: PCBs in products database development Phase I Scope of Work

Spokane River Regional Toxics Task Force – TSCA/iPCB Workgroup Meeting

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Background

- Database development history
  - SRRTTF's 2016 Comprehensive plan:
    - Section 5.8: "This Control Action consists of…creation of a database to store the collected information….public education on products containing PCBs…providing consumers the opportunity to select products with lower PCB content."
    - Section 5.8.2: "Support Ecology in its development of a centralized clearinghouse containing PCB product testing information."
  - TSCA Workgroup Meeting Summaries
    - "C. Niemi reported this element of the Comprehensive Plan may not have been fully understood by Ecology Management, since the existing Ecology data base cannot easily accept outside data and would be very labor intensive." (6/3/20)
    - "K. Rains confirmed that Ecology already has a products data base, but that it is limited to Ecology related work and that expanding it beyond may be difficult, especially considering resource limitations." (8/5/20)

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Background

- Database development history
  - PCB's in products focus group meeting (6/19/20) to discuss pathways for project
    1. Discuss potential SRRTTF partnerships with entities (e.g., Gonzaga, Rutgers, Ecology) to develop and host a database
    2. Determine database goals, purpose, and structure, e.g.,:
       - Intended Audience
       - Criteria for Product inclusion
       - 1668 only or other
       - What will database hold: iPCBs (congeners), Arochlors, sampling methodology
       - What is a "product" (eg., a can, label)
       - What data gets accepted
       - QA/QC - Quality criteria, level of validation required
       - Public interface?
  - Meeting outcome: Determine if there is sufficient data that would justify developing a database before trying to reach agreement on the items above

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Phase I – Scope of Work

- Primary goal - determine if there is sufficient data that would warrant the development of a database
- Secondary goal - connect with entities interested in working together to achieve common goals (e.g., address discrepancy between TSCA and WQ regulations)

Phase I – Scope of Work

- Task 1: Request data from entities suspected of testing for PCBs in products by contacting:
  - The clients of 1668 performing labs
  - ECOS member agencies
  - Washington DES for leads
  - SRRTTF mailing list
  - Organizations through an online search
    - Start w/ regions where PCBs are a known challenge (e.g., SF Bay, DRBC, Chesapeake Bay)
- Task 2: Search online for PCBs in products data
  - Peer reviewed and non-peer reviewed studies
  - Gray literature (not commercially published)
  - Focus on products sold in U.S.

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Task 1 Efforts

- Client lists of 1668 performing lab
  - Labs were contacted between 8/5 and 8/10
  - 27 lab were identified from:
    - USEPA Method 1668a Interlaboratory Validation Study (2010)
    - WA State Accredited Lab List
    - Online search & references from other labs
  - No labs were willing to share client contact information

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Task 1 Efforts

- Client lists of 1668 performing lab
  - 7 labs said they would forward message to clients informing them of this effort and how to contact me
    - Many stated they thought their clients may not want their data to be shared
    - Several indicated they perform limited testing for PCBs in products
    - Several of the 7 labs seemed enthusiastic about helping
    - To-date, this has not identified any datasets
  - Remaining 20 labs
    - 5 said they do not test products
    - 3 EPA labs directed us to Michelle Mullen
    - 12 labs either went out of business, merged w/ another lab, or did not respond or express interest in helping
  - Labs contacted and their responses are documented in project excel file

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Task 1 Efforts

- ECOS member agencies
  - Cheryl Niemi and Ken Zarker connected us with ECOS
  - An ECOS project manager said they would forward a message on 8/5/20:
    - Via ECOS weekly newsletter
    - To an ECOS toxics workgroup
  - This has not identified any datasets to-date
- Washington State DES
  - Did not know of additional leads
- Request to SRRTTF mailing list sent on 8/4/20
  - No additional leads developed through this avenue

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Task 1 Efforts

- Additional individuals and organizations contacted
  - Several searches were performed in Google and 10 pages of search results were viewed for each search. Terms searched included:
    - "PCBs in products"
    - "Inadvertent PCBs"
    - "Non-aroclor PCBs"
  - Based on this search, 26 individuals were contacted representing 26 different organizations that made mention of iPCBs on a website or reports
    - Organizations contacted and their response is documented in project excel file

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Task 1 Efforts

- Additional individuals and organizations contacted
  - Entities in different regions seemed well connected with other potentially interested parties in the region
    - E.g., emails were initially sent to SF Bay Water Quality Board and San Francisco Estuary institute
      - In replies they both cc'd the other organization and common individuals at DTC Environmental
  - Only 1 entity, the City of Roanoke, stated they are planning municipal product testing for PCBs this winter/spring
    - No other entities have performed or plan to do PCB product testing
  - Data collected by the EPA Region 10 office was also identified
    - However, SRRTTF is already familiar w/ this data that was presented by Michelle Mullen to the SRRTTF in August 2019

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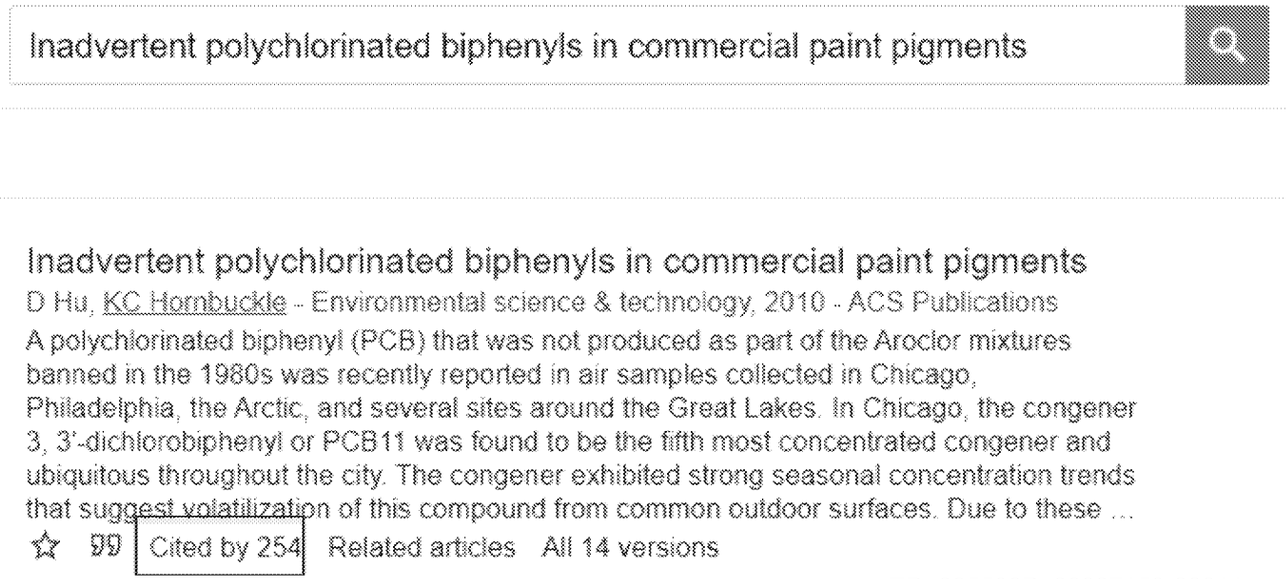
Task 2 Efforts

- Reports and articles were collected after searching Google and Google Scholar viewing 10 pages of search results using the following terms:
  - "PCBs in products"
  - "Inadvertent PCBs"
  - "Non-aroclor PCBs"
- Citations lists found in relevant articles were also inspected
- Articles that cited relevant articles found in Google Scholar were also explored
  - E.g., 254 articles from Hu & Hornbuckle (2010) were checked



Results and findings

- Summary of non-peer reviewed data

Source	# of Congeners	# of products tested	Date collected	Product origin	Analytical technique	Status/Availability
USEPA (Region 10)	209	16 consumer products	2018	US	HR-GC-MS	Available
City of Roanoke	209	20 Municipal products	Winter/spring 2021	US	Unknown, testing at UMBC	Not yet available
Japanese Ministry of Economy, Trade and Industry	Unknown	588 pigments	2013	Japan	Unknown	Unavailable
City of Spokane	209	41* Municipal and consumer products	2015	US	1668	Available
Department of Ecology	209	216 samples from 201 commercial and consumer products, 175 products will be tested	2013-2015	US	1668	Available
SRRTTF	Total PCBs, congeners for one sample	4 products, 21 samples from product components	2015	US	AXYS MLA-007	Available

*from conclusions of report, though introduction says nearly 50 samples and we counted 46

Results and findings

- Summary of data from peer-reviewed articles

Study #	# of Congeners analyzed	# of products tested	Date collected	Product origin	Analytical technique*	QA/QC Procedures?
1	209	30 Paints	~2015	Japan, Europe	HR-GC-MS	Yes
2	209	46 Pigments	~2014	Japan	HR-GC-MS	Yes
3	209	13 silicone products		Japan	HR-GC-MS	Yes
4	Total PCBs	1 Pigment	1996	US	Unknown	No
5	18	5 Titanium dioxide products	2016	Europe, US	HR-GC-MS	Yes
6	1	45 Paper products and textiles	2013	N. & S. America, Europe, Asia	HR-GC-MS	Yes
7	209	30 Pigments	~2010	US	1668A	Yes
8	25	5 pesticides	2015	China	HR-GC-MS	Yes
9	12	10 herbicides	~2013	China	HR-GC-MS	Yes
10	14	6 pesticides	1967-1998	Japan	GC-MS	No
11	209	1 Silicone tubing	1994	Slovenia	HR-GC-MS	No
12	Isomers	11 Printing ink	1992	Denmark	GC-MS	No
13	209	9 pigments	2009-2018	US	1668A	Yes
14	1	18 Paper and plastic products	2008	US	HR-GC-MS	Yes
15	209	24 Pigments	2010	China	1668A	Yes
16	Sum of aroclor	7 Paper products	~1988	Europe	GC-ECD	No
17	Total PCBs	6 pigments	~1985	US	GC-MS/ECD	No

*Most studies did not specify a method, only:

- the extraction approach involving solid & liquid phase extraction (e.g., hexane, $MeCl_2$)
- Type of analytical instrumentation (e.g., GC-MS)

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Results and findings

- Ecology vs other datasets
  - The WA Dept. of Ecology has the largest dataset that is larger than all other datasets combined
  - However, other datasets provide:
    - a comparable # of samples tested for PCBs
    - ~60% of the datapoints that Ecology's dataset will provide

Data Type	# of samples tested and soon to be tested	# of products w/ QA/QC	# of products w/o QA/QC	# of products × # analytes = datapoints*
Peer reviewed	267	235	32	~32,528
Non-peer reviewed that is or will be available (Excluding Ecology)	78 (existing) + 20 (future) products = 98	?	?	~16,114
Department of Ecology	216 (existing) + 175 (future) products = 391	391	0	~81,719
Non-Ecology/Ecology Data X 100%	93%			~%60

*The majority of datapoints are non-detect, and values are slight over-estimates as it was assumed studies testing for all congeners were able to analyze all 209, however, all 209 congeners cannot always be resolved because some co-elute

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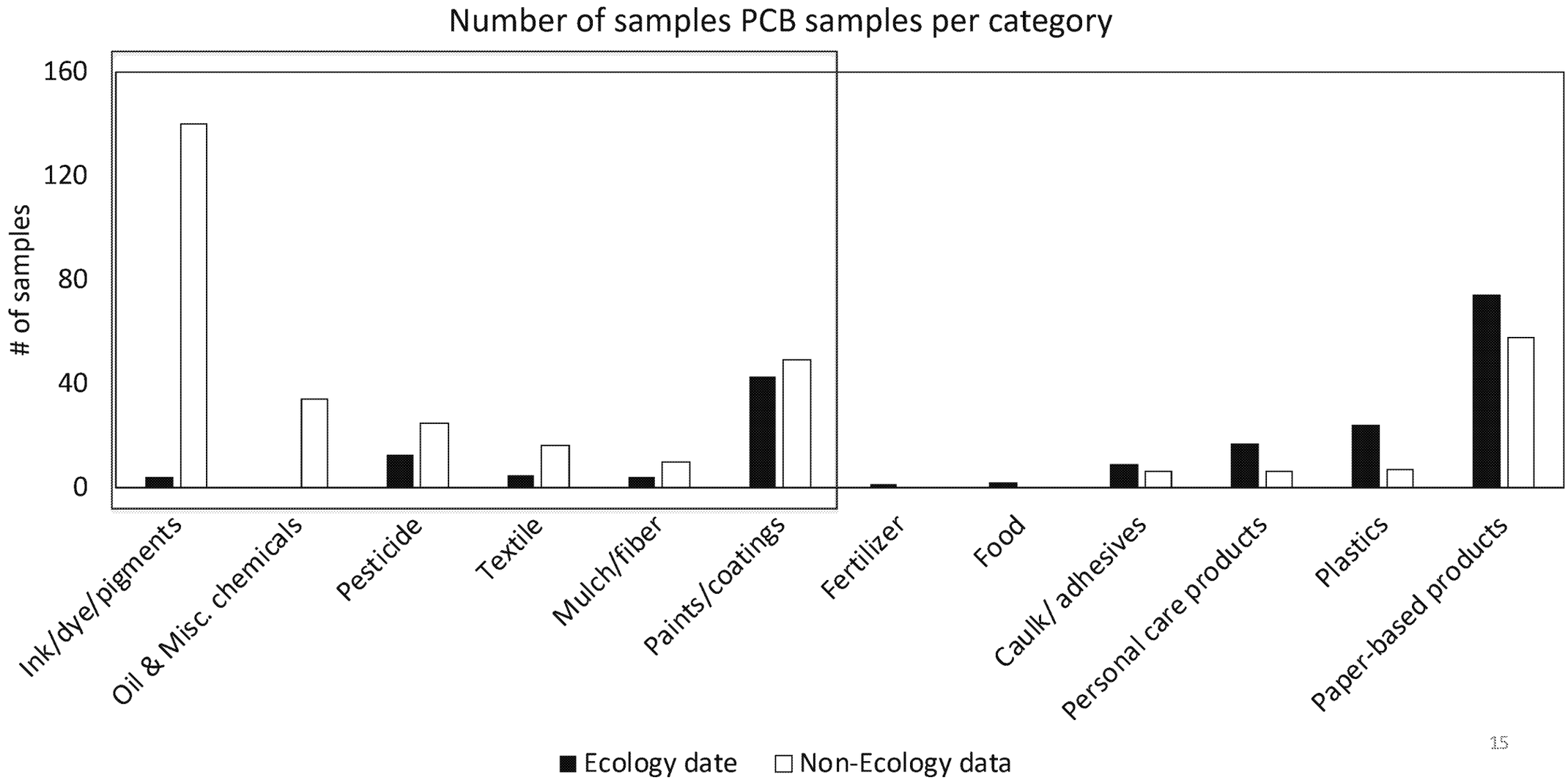
Results and findings

- Ecology vs other datasets
  - There is more non-Ecology data for the categories boxed below



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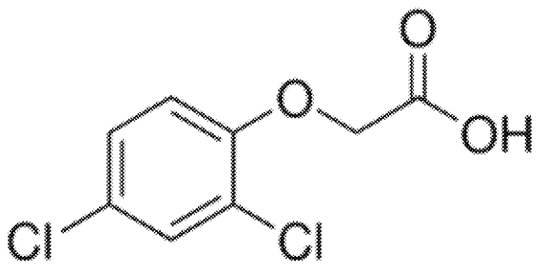
2,4-D



- Data interpretation was outside the scope of work…
  - But, it was noticed for the herbicide 2,4-D:
    - City of Spokane's 2015 study found PCBs were below detection
    - Liu et al. (2013) detected the sum of pentachlorobiphenyls (PeCBs) ranged from non-detect to 63,255 ± 981 ppq depending on manufacturer
    - Highlights importance of partially redundant testing
    - Since 2,4-D is widely used in Eastern Washington, could be a source of PCBs in the Spokane River?

STATE OF WASHINGTON

DEPARTMENT OF AGRICULTURE

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WSDA Reminds Herbicide Users to Follow State Regulations Especially During High Temperatures
July 2010

Phenoxy hormone-type herbicides — including 2,4-D — are some of the most commonly used herbicides in Eastern Washington. They are used to control broadleaf weeds on rangeland and

Potential partnering agencies

- The following individuals/organizations expressed interest in being looped in to SRRTTF efforts to address TSCA & WQ regulation differences
  - Email exchanges are in PDF format in project folder

	Contact	Organization
1	Andre Algazi, Simona Balan	California DTSC
2	Leigh Anne Weitzenfeld	City of Roanoke
3	John Yageic, Ron MacGillivary	DRBC
4	Janet O'Hara	SF Bay Water Quality Board
5	Mark Richards	Virginia DEQ
6	Heather Trim	Zero Waste Washington

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Next Steps

- Reasons to develop database
  - Ecology's database is limited to Ecology-collected data and is the only known publicly available database
  - There is a substantial amount of PCBs in products data not found in Ecology's database
  - Building a database could spur future data contributions (build it and they will come?)
  - Most data has some form of QA/QC
- Reasons not to develop database
  - Most of the data identified is already publicly available (though not in one location)
  - A significant amount of the peer-reviewed studies collected data for products outside the US
- If SRRTTF decides to pursue database development, GU may be interested:
  - Civil/Environmental Engineering students could support database development and maintenance as research assistants, a student club has expressed interest (Zags w/o Boarders), and class projects
  - A computer science faculty member indicated C.S. students should have the ability to create an interface that can interact with the public

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Next Steps

- Mike Peterson and Kyle Shimabuku were invited to present at the Roanoke River Conference on October 21-22 about PCB challenges along the Spokane River and iPCBs in products data

Work products: Review project excel sheet and project folder to be shared

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Thank you!